

Patent Claims

1. A mixture of powders suitable for preparation of absorbable calcium phosphate cements comprising:
- 5     ✓     tricalcium phosphate (TCP) in which,  
          -30 to 70% of the TCP particles have a particle size of 0.1 to 7um and  
          -10 to 60% of the TCP particles have a particle size of 40 to 100 um;
- 10     precipitated hydroxylapatite (PHA) wherein the PHA is a cation-deficient hydroxylapatite of the formula I  
           $\text{Ca}_{8.75}\text{V}(\text{Ca})_{1.25}[(\text{HPO}_4)_{5.5-x}(\text{CO}_3)_{0.5}](\text{OH})_x\text{V}(\text{OH})_{2-x}$      in which x is 0-2 ;and
- 15     at least one other phosphate -containing inorganic compound.
2. A mixture according to claim 1, wherein said mixture after hardening has a compressive strength of
- 20     between 70 - 80 Mpa.
3. A mixture according to claim 1, wherein the PHA has a particle size of 0.5- 10 um.
- 25     4. A mixture according to claim 3, wherein the PHA has a particle size of 0.5 - 5 um.
5. A mixture according to claim 1, wherein the PHA content is from 1 - 5% by weight, based on the total
- 30     dry mass.
6. A mixture according to claim 1, wherein the PHA content is from 1.7 - 2.7 % by weight, based on the total dry mass.
- 35     7. A mixture according to claim 1, wherein said at least one other phosphate-containing inorganic compound is selected from  $\text{CaHPO}_4$ , carbonate-containing apatite and  $\text{CaCO}_3$ .

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8. A mixture according to claim 1, additionally comprising a setting accelerator.

5 9. A mixture according to claim 1, additionally comprising a pharmaceutically active ingredient.

10 10. A mixture according to claim 9, wherein said pharmaceutically active ingredient is an antibiotic or disinfectant.

11. A mixture according to claim 1, present in the form of an aqueous solution, suspension or paste.

15 12. A biodegradable implant produced from a hardened mixture according to claim 11.

20 13. A method of preparing biodegradable implantable synthetic bone materials comprising, hardening a mixture according to claim 1.

25 14. A mixture according to claim 9, wherein said pharmaceutically active ingredient is a growth factor or a prostaglandin.

30 15. A mixture according to claim 14, wherein said growth factor is a bone morphogenic protein, a tissue growth factor, a fibroblast growth factor, or a growth factor from the TGF $\beta$  superfamily.

16. An absorbable calcium phosphate cement paste comprising cement powders according to claim 1, and a liquid phase.

35 17. A kit for the preparation of a bio-cement paste comprising a mixture of powders according to claim 1, a pharmaceutical active ingredient and a liquid phase.

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20. A method of repairing bone fractures comprising applying an absorbable calcium phosphate paste according to claim 16, to a bone fracture.

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